OBSERVATIONS

ON

Marine Vermes, Inſects, &c.

By MATTHEW MARTIN,

Member of the BATH philoſophical Society.

With NOTES and QUOTATIONS from different Authors.

FASCICULUS I.

Let Heaven and Earth praiſe the Lord:
The Sea, and all that moveth therein. v. Pſalm 69.

17.

EXETER:
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TO

SIR JOSEPH BANKS, BARONET,

PRESIDENT OF THE ROYAL SOCIETY;

BY WHOSE ACTIVE EXERTIONS,

AND UNDER WHOSE PATRONAGE,

THE SCIENCE OF NATURAL HISTORY

HAS BEEN SO LARGELY AUGMENTED,

SO LIBERALLY SUPPORTED;

THESE OBSERVATIONS,

ARE, WITH RESPECT, INSCRIBED,

BY HIS OBLIGED, AND

GRATEFUL SERVANT,

MATTHEW MARTIN.

Teingmouth,
Devon, 1786.

PREFACE.

I HAVE for ſome years purſued a practice of entering notes on various ſubjects of natural Hiſtory, which have fallen within the verge of my obſervation; and have made drawings of ſeveral, to which for various reaſons I have been induced to give this preference.

It has been my uſual method to connect my Notes and Drawings by correſpondent Numbers, but with the great variety of matters which I have had in hand, and my attention divided between collecting materials for the ſyſtematic arrangement of ſome, the acquiſition, feeding, enquiry into the metamorphoſis, propagation, or curious and intereſting manners of others, beſides the calls which my Family, and other important avocations have made on my leiſure; it has occaſionally happened that the marks of their connexion have been omitted, and the validity of ſuch notes conſequently leſſened.

Theſe I might probably have ſuppreſſed, if upon reviſal I had found general reaſon to be ſatisfied with the accuracy of the reſt; but the truth is, that many of them having been written in a curſory and interrupted manner, they fall ſhort of their primary intention, and if I was carefully to diſcard the imperfect, I am perſuaded none would remain.

Beſides it has ſo happened that I have been ſometimes more than ordinary remiſs, where I ſhould have particularly wiſhed to have been otherwiſe; but as I thank God I am bleſſed with a good recollection, I hope I ſhall not materially miſlead my Readers by truſting to it in certain inſtances, in which I may be induced to call in its aſſiſtance to ſupply the deficiencies of my Notes, either with reſpect to their ſubſtance or their connection.

And as it is probable I may find frequent occaſion ſo to do, I have thought proper to give this general warning of ſuch my intentions.

INTRODUCTION.

AMONGST the numerous Authors who have variouſly engaged their pens and pencils in the ſervice of natural Hiſtory; few I ſhould ſuppoſe if any have ſo entirely failed in their deſign, as not to have in ſome degree advanced this favorite Science.

The imperfection or want of method which may be aſcribed to ſome of the beſt, is in my opinion the leſs to be regretted, if we find reaſon to ſuppoſe that too ſtrict an attention to regular arrangement, would have abſorbed much of that time, which has been employed in preparing a greater quantity of materials, in favor of further progreſs.

Had it not been for the works of Petiver, Goedart, and other promiſcuous Writers, the World would hardly have been at this time favored with the ſyſtematic productions of Linnæus, Scopoli, Fabricius, &c.

Nor are the Writers of leſſer note to be utterly diſregarded; for tho' the labors and faculties of ſuch may appear confined, they may however be found competent to furniſh many uſeful hints, to more able Enquirers.

Encouraged with theſe perſuaſions, and convinced that the rage for ſyſtem has in this Age, prematurely obtruded haſty productions on the World; I am bold to ſubmit the following obſervations to the candor of the public eye.

If all who have leiſure and genius would liberally communicate the reſult of their reſearches, how greatly would the progreſs of this ſcience be advanced! what a fund of new materials would be acquired, for the entertainment and inſtruction not only of young beginners, but of Proficients alſo; who by juſt attention to the characters exhibited in ſuch an aggregate, might thence derive conſiderable aſſiſtance in ſubdviding ſuper-abundant, or connecting ſcanty Genera; in correcting errors, reſolving doubts, and eſtabliſhing proprieties in former ſyſtems.

The ſcience of natural Hiſtory is not as yet arrived at that pinnacle of perfection, not to be improvable even by the weak efforts of humble Admirers.

In the animal kingdom, the Vermes for inſtance, a numerous and complex race, are very imperfectly known by us.

Linnæus has attempted to ſubjugate them to certain rules of his ſyſtem; I ſay attempted, for that he did not conſtantly ſucceed, will I apprehend be readily granted, and his failure may probably be imputed to the want of that previous acquaintance with them, which was neceſſary to the better ſucceſs of ſuch an attempt.

For my own part, I ſhould rather ſuppoſe, that our knowledge of theſe Animals is not as yet mature for ſyſtem, and that therefore it is adviſable to give many of theſe a particular attention, rather than haſtily to decide on their general connections.

Inſects, probably from being more obvious and inviting, have been more generally attended to; yet even amongſt theſe, it is likely many characters are concealed, which, if detected, would occaſion ſtrange revolutions in modern ſyſtems: The publications of Fabricius may lead us to ſuppoſe this.

In purſuing the hiſtory of theſe little Animals, the attention is agreeably directed to their various modes of feeding, and of breeding; from the knowledge of which we may gather hints, for guarding againſt the depredations, or leſſening the numbers of the noxious; or for procuring, preſerving, and encouraging the increaſe, of more pleaſing and inoffenſive kinds.

On the former of theſe points, the ingenious Author above named has thrown a conſiderable light; and appears to have paid a very minute attention to the different conſtructions of their mouths: The characters hence derived, may be regarded amongſt the moſt natural; and the Pygmy race are aggrandized in the idea of their being diſtinguiſhable in a manner ſo ſimilar to that, by which larger Animals have been already diſcriminated; their reſemblance to which appears the ſtronger, in the conſideration that they are alſo variouſly adapted to the habitation of Earth, Air, or Water; and diverſly endued with diſpoſitions for rapine, or more placid life.

From ſome ſimilarity of manners, we may proceed to compare certain of the Spider race with Lions or Wolves; others of the ſame race which inſidiouſly creep and ſpring upon their prey by ſurpriſe, with Tigers; the great Libellæ in the aquatic ſtate of Larva, with Alligators; the ſame inſects in the Fly ſtate, Hornets, and others of the larger rapacious winged tribe, with Eagles, Waſps with Hawks; and the Ichneumon with the Cuckoo.*

And as to external characters, the attention to theſe, beſides the pleaſure it affords in the contemplation of varied beauties; may moreover be conſidered as a proper prelude, to a more cloſe obſervation and compariſon of their ſeveral manners and cuſtoms; ſince amongſt theſe externals, we are taught to ſeek for thoſe marks, according to which, the ſubjects have been diſtinguiſhed by different Syſtematiſts: and altho' the labors that theſe Authors have ſeverally beſtowed, would be ill requited with cavil at every ſlight imperfection, which eyes leſs engaged may find leiſure to detect; and that

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* The generality of Ichneumons admit of ſome compariſon with theſe ſubtile Birds; but I here mean to allude particularly to thoſe Species, which depoſit their eggs in the eggs of other Inſects, thus ſupplanting the proper offspring by the introduction of their own.

*. Lin. Syſt. Nat. T. 2. p. 940 No. 73. Ichneumon Ovulorum. & Lin. Faun. ſuec. No. 1644.

an attempt to render theſe labors uſeleſs, by a total ſubverſion of their productions, might juſtly be deemed an illiberal attack; yet I apprehend it cannot be denied, but that even in the beſt of our ſyſtems, there are errors of that magnitude as to require correction, difficulties which plead for ſolution, and chaſms which demand ſupplies.

Obſervations ſomewhat ſimilar to theſe, may be found to hold good with reſpect to Vegetables, eſpecially the *cryptogamia*; and to other Subjects of nature.

Is it not then a time to call on thoſe who have leiſure and genius for theſe purſuits to lend an aſſiſting hand? and by a diſplay of ſuch marks as each may reſpectively prefer, to ſubſcribe to a general fund, for the gradual abatement of the imperfections complained of?

I wiſh my endeavors may tend to elucidate, and intereſt others [†] to purſue theſe inveſtigations; that in the courſe of theſe they may be bleſſed with tranquility; ſecluded from the carking cares, and galling paſſions of the World, and gently conducted thro' paths of preſent content and peace, towards the permanent enjoyment of Truth and Happineſs.

Feeble as my efforts may be found, yet whilſt under the influence of ſuch deſires, I truſt I may rely on a favorable reception from the britiſh Public.

[†] In a ſmall work (the Aurelian's vade mecum) lately publiſhed, I have taken occaſion to invite the Ladies to engage in the pleaſing ſtudy of natural Hiſtory, I here wiſh to enforce the invitation, perſuaded that the ſcience might derive conſiderable advantage, and themſelves much gratification, from the exertion of their kind endeavors to promote its progreſs.

OBSERVATIONS

ON

MARINE VERMES, INSECTS, &c.

No. I. v. TAB. I. FIG. 1.

*§ACTINIA.	SEA-FLOWER.
CARYO-PHYLLUS. — A. dianthoïdes, rubro-fuſca; flore pleno.	CLOVE.— S.-F. Like the Dianthus, red-brown: with a double flower.
An Dianthi Varietas?	Is it a variety of the Dianthus?

AS many who have not viſited the Sea Coaſts, are unacquainted with this race of Animals, it may not be amiſs to mention a few particulars concerning them.

I ſuppoſe the name ACTINIA is derived from the Greek word 'ΑΚΤΙ'Ν, which ſignifies a ray; and has been given to them, on account of their numerous divergent tentacula; and that their ſtrong reſemblance to a flower, when theſe

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* v. Apology in Preface.

§ The ACTINIÆ are ranked in the *linnæan* Syſtem, in the VIth Claſs of Animals, viz. VERMES, and in the IId. Order, MOLLUSCA.

CLASSIS VI. VERMES.	*CLASS VI.* WORMS.
TARDIGRADA, mollia, pandentia, vivaciſſima, redintegranda, humidi Animantia, *acephala, apoda, androgyna, Tentaculis* dignoſcenda.	Slow of motion, ſoft, expanſive, tenacious of life, from parts becoming whole, Enliveners of moiſt places, without head, without feet, androgynous, diſtinguiſhable by their tentacula.
IMPERFECTA veteribus, nec inepte, dicta animantia, deſtituuntur Capite, Auribus, Naſo, Oculis pleraque, Pedibus, ab Inſectis itaque diverſiſſima, a quibus dudum removi naturæ cryptogama: ſunt *Inteſtina, Molluſca, Teſtacea, Lithophyta, Zoophyta.* -	By the Ancients, not without ſome *(tho' falſe)* appearance of grounds, reputed imperfect Animals; being deſtitute of Head, Noſe, and moſtly of Eyes, and Feet; very different therefore from Inſects, from which I have lately diſtinguiſhed theſe ſubjects of ſecret, myſterious generation. They are, *I. Gutſhaped, II. Soft, III. Shell-worms, IV. Lithophytes, V. Zoophytes.* - - - - -
II. MOLLUSCA.	II. SOFT.

tentacula are extended, and themſelves expanded, has obtained them the *engliſh* title of Sea Anemone.

From this ambiguity of their appearance, ſeems to have ariſen a diverſity of opinions reſpecting their nature; ſome having ſuppoſed them Vegetables: but their locomotive power, method of feeding, and other circumſtances, ſufficiently evince the contrary perſuaſion, that they are real Animals.

Their tentacula ſerve them (if not with eyes to diſcover, which I ſuſpect they may; yet) as hands to retain their food, and direct it to their central mouth.

They have been frequently mentioned as partaking of the extraordinary faculty of increaſing by cuttings, like freſh water Polypi; it is however probable all are not equally endued with it, for in an experiment tried, tho' I recollect that the pieces continued a long time, I ſuppoſe 8 or 10 weeks or more, in ſeparate exiſtence, yet neither in this inſtance nor in any other, do I remember them to have attained perfection: at the ſame time I confeſs my own experiments have not qualified me to ſpeak much to this point of their hiſtory.

They differ in ſhape, ſize, color, and even in diſpoſition: ſome ſeem to prefer a ſituation near the ſhores, others in the more diſtant deeps: ſome in part concealed in the ſand, or crevices of the rocks; others more expoſed.

The

II. MOLLUSCA.

Animalia *ſimplicia* nuda, *(abſque Teſta inhabitata)*, *artubus inſtructa*, vagantur pleraque per maria. cœlo reſplendentia, tanquam totidem lucernis tenebricoſum illuminant abyſſum Phoſphorea, ut quod eſt inferius, ſit tanquam ſuperius.

ACTINIA.

Corpus ſe affigens baſi, oblongum. teres apice dilatabili intus tentaculato.

Os terminale dentibus incurvis; *Roſtro* cylindrico radiato.

(Apertura præter os nulla.)

v. Lin. Syſt. Nat. T. I. p. 1069. 1081. & 1088.

Fauces hæc Animalia, ſubtus ſacci inſtar penitus clauſa, ſuperne habent pro libitu tam patulas, ut mytilos ſatis magnos aliaſve conchas ingurgitent, e quibus modo nos fugiente, piſces extrahere, & evacuatas teſtas per eandem aperturam, ejicere rurſus valent. Quæ teſtæ ſi majores ſint & ægre per fauces tranſituræ eſſent, ---- non ſolum fauces late expandit, ſed eaſdem ut ſolemus tibialia, quaſi invertit, quo ſpatium brevius & apertura ſit latior. Eundem in aquæ dulcis Polypis motum obſervavimus.

v. Baſt. opuſc. ſubſec. p. 122.

II. SOFT.

Simple, naked *(without teſtaceous habitation)*, *furniſhed with Limbs*, moſtly inhabitants of the Seas, *and* glittering with light, with their phoſphoreous quality illuminating the dark Abyſs, ſo that what is there below, may be as if above.

SEA-FLOWER.

Body affixing itſelf at the baſe, oblong, round: Top dilatable, internally tentaculated:

Mouth terminal with incurved teeth; Roſtrum cylindric, radiated.

(No Aperture except the Mouth).

Theſe Animals, imperforate at the baſe, have at top ſuch extenſible Mouths, as to take in pretty large Muſſels, or other Shell-worms; from which, in a manner unperceived by us, they have the power to extract the Animals, and return the vacant Shells through the ſame Aperture: which Shells, if of ſo large a ſize as hardly to be paſſed through the mouth, the Animal not only dilates its mouth, but as it were turns it inſide out, ſomewhat in the manner that we do ſtockings; by which means the ſpace becomes ſhorter, and the Aperture wider. We have obſerved the ſame circumſtance in freſh water Polypi.

The colors of ſome are vivid and beautiful to a degree; roſe color, blue, purple, green, yellow, &c, variouſly adorn the different Species. Their tentacula, from which no inſignificant part of their beauty is derived, vary alſo conſiderably.

Mr.[*] Ellis long ſince deſcribed a particular Species, under the titles Actinia dianthus, or Sea carnation, titles admirably adapted to diſtinguiſh thoſe kinds, whoſe laciniated edges, give them a ſtrong reſemblance to the flowers of that Genus.

I have purſued the Idea, and denominated mine CARYOPHYLLUS; and have in the ſhort deſcription, compared it to the DIANTHUS.[†]

I recollect three different kinds of ACTINIÆ, which may be conſidered as of this Family; the CARYOPHYLLUS juſt mentioned; a large white Species, which I take to be the true ACTINIA dianthus of Ellis, and another of a pink color: the latter very plentiful under ſhelter of the rocks near the Dawliſh ſhore, not very diſtant from this place; whereas of the two former, I recollect few if any, that have not either been dredged from the deeps, or perhaps caſt on ſhore by very tempeſtuous Seas.

Muller would probably have conſidered all theſe as varieties of the § plumoſa; but if this was the caſe, they would I ſhould ſuppoſe be found in more promiſcuous ſociety.

In Animals ſo little known, it is difficult to preſerve the due medium, between treating Varieties as diſtinct Species, or diſtinct Species as Varieties; and perhaps he has run into the latter error.

To determine the real ſpecific characters, would require a very cloſe attention; and I ſhould think conſiderable aſſiſtance may be gained, by obſerving the various forms, proportions, numbers, and diſpoſitions, of the tentacula; and as theſe curious Animals are generally poſſeſſed of attractive novelty and beauty, I hope ſome of my Readers in their viſits to the Sea-coaſts, will be induced to examine and compare them; and that at ſome future time, I ſhall myſelf be enabled to throw further lights on the ſubject.

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[*] v. Ph. Tr. 1767. p. 436. tab. XIX. fig. 8.

[†] DIANTHUS in Botany is the generic title of Pinks and Carnations.

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§ 2791. ACTINIA *plumoſa* tentaculis parvis, margine penicillis cirrata.

Variat colore caſtaneo, luteo-fuſco, luteo-virenti, & albo; maxime pellucida & opaca; laciniæ faucis quoque variant albæ, rufæ, aurantiæ. - - - - - - veras Actiniarum notas differentiales auctores nondum aſſecuti ſunt.

v. Müll. Verm. Moll. Hydra. Actin.

SEA-FLOWER *plumous*, the margin fringed with cluſters of ſmall tentacula.

Varies in color, cheſtnut, yellow-brown, yellow-green, and white, and in being very tranſparent or opaque; the fringes alſo vary in being white, red, and orange colored.

Authors have not as yet diſcovered the true ſpecific diſtinctions of Sea-Flowers.

No. II. v. Tab. I. Fig. 2. a. 2. b. & 2. c.

* **SIPHUNCULUS.** *Corpus* teres.
Cauda tumeſcens.
Collum extenſile.
Os laciniatum.
§ *Anus?* (Animalis quieſcentis contracti,) anterior.

NUDUS. S. flaveſcens; *Caudâ* pallidâ, *Collo*-que pallidiore fuſco punctatis: *Ano?* vix conſpicuo.

§ *Apertura* lateralis Lin?
v. Fig. 2. b—b. b.

* **TUBE-WORM.** *Body* long and round.
Tail frequently ſwelling.
Mouth fringed.
§ *Anus?* (when the Animal is quiet and contracted,) anterior.

NAKED T. yellowiſh; at each end pallid, and dotted with fuſcus: *Anus?* hardly conſpicuous.

§ the lateral *Aperture* of Linnæus?
v. Fig. 2. b—b. b.

UPON handling this Animal it became turgid; v. f. 2. c I obſerved on it a ſmall riſing, obliquely croſs-barred, v. f. 2 c. c. c this was probably a bliſter on the ſkin, (which it ſeems as if this Genus have a power of raiſing) and

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* SIPHUNCULUS, anglice little Tube.
* The Siphunculi are ranked in the *linnæan* Syſtem in the 6th Claſs of Animals, viz. VERMES, and the Iſt Order MOLLUSCA.

ANIMALIA
CLASSIS VI.
VERMES.

INTESTINA Animalia nuda (*ſimplicia, abſque artubus,*) terrena quondam dicta, ob ſummam ſimplicitatem corporis, terebrant omnia; perforat *Gordins* Argillam, ut aqua tranet; *Lumbricus* Humum ne ſitu corrumpatur; *Myxine* Cadavera ut liqueſcant; *Teredo* Ligna, ut deſtruantur; quemadmodum Pholades, & Mytili lithophagi Petras, ut ſolvantur. - -

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279. SIPUNCULUS. *Corpus* teres, elongatum.
Os anticum, attenuatum, cylindricum.
Apertura lateralis corporis, verruciformis.

nudus. 1. S. corpore nudo.

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Habitat in Oceano Europæo, *ſub lapidibus.*
v. Lin. Syſt. Nat. T. 1. p. 1069. 1075. 1078. &c.

† In

ANIMALS
CLASS VI.
DIV. I. *WORMS.*

GUT-SHAPED. *Simple* Animals, naked, and without limbs. Formerly reckoned with Earthworms, on account of the great ſimplicity of their bodies; they pierce all things; the *Gordins (Hair-worm)* the Clay, that the water may paſs through; the *Lumbricus (Earth-worm)* the Ground, leſt it ſhould become mouldy and corrupt; The *Myxine (Hag)* Carcaſes, that they may diſſolve; The *Teredo (Piercer,* or *Auger-worm?)* Logs of Wood, that they may be deſtroyed; even as the Pholades (Dactyls); and the Stone-conſuming Mytili, perforate the rocks, that theſe alſo may periſh.

TUBE-WORM. *Body* long and round.
Mouth anterior, attenuated, cylindric.
A puſtular *Aperture* on the ſide of the body.

naked T. Body naked.

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Inhabits the europæan Ocean, *under ſtones.*

† We

and not the Apertura lateralis mentioned by Linnæus, which I have rather conſidered as the Anus. v. f. 2 b—b. b—I recollect however to have ſeen a Siphunculus caſt out an excrementitious matter through that part, which I ſtill conſider as the Mouth : It is poſſible that like the Actiniæ, it may receive its food and return its *Fæces* through the ſame Paſſage, and that what Linnæus has called Apertura lateralis, if really perforated, is adapted to ſome other purpoſe.

From the Sea Side near Teingmouth.

Though one ſhould not ſuppoſe this Species very uncommon, as having been noticed by ſeveral Authors ; yet I do not recollect to have obſerved it in theſe parts before laſt year ; nor although I have had opportunties of noticing ſeveral to have ever known it much if at all exceed the length of the figures 2 a, 2. b, and 2. c, notwithſtanding the great ſize aſcribed to it by Rondeletius.†

The figures are deſigned to repreſent it under different appearances ; 2. a. with the Mouth concealed ; 2. b. the Mouth extruded ;—the Tail appearing more ſwollen and bearded—2. c, in a turgid ſtate the appearance of the tail altered ; the point not ſimple.

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† In luto Maris & marinorum ſtagnorum vivere comperimus eum, Vermem ---- qui ------ aliquando duorum cubitorum magnitudinem æquat polliciſque craſſitudinem. Farciminis longi figuram refert. roſtro eſt ---- longiore, ---- ſimili Hippocampi roſtro, unde μακρορυγχοτερον nuncupavimus.

Intus longum duntaxat Ventriculi, vel inteſtini ductum habet, aqua & luto pleni : unde perſpicuum eſt his tantum veſci ----------------

v. Rondel. de Inſectis & Zooph. liber p. 110.

† We have found that this Worm, which ſometimes attains the length of two Cubits, and the thickneſs of one's thumb, lives in the mud of the Sea, and of ſalt water Lakes. In figure it reſembles a long ſauſage ; the beak long, reſembling that of the Hippocampus, on account of which we have named it μακρορυγχοτερον, *(which with the inſertion of a π, may be underſtood long-quill-ſnouted,* or *having a long tubular ſnout :)*

Internally it has only a ventricular or inteſtinal duct, full of mud and water : whence it manifeſtly fed on theſe alone.

No. III. v. Tab. 1. Fig. 3.

* SIPHUNCULUS.	* TUBE-WORM.
RETICULATUS. ſaccatus Lin? S. pallide fuſcus, ſulcis annularibus, Striiſque longitudinalibus reticulatus; æneo viridi ſplendidus, et ad utramque extremitatem cinereus; *Cauda* nitida:	RETICULATED. T. pale brown, reticulated by annular furrows and longitudinal ſtreaks; and ſhining with reflections of braſſy-green; at each extremity aſh-colored: Tail highly gloſſy.
§ *Ano?* conſpicuo, radiato.	§ *Anus?* conſpicuous, radiated.

* For generic characters, &c. v. No. II.
§ v. Tab. I. Fig. 3. a. a.

IT is probable that few, contemplating this Animal in a ſtate of Health only, would ſuppoſe it the Species, to which the *linnæan* name and deſcription refer.§

Though I have frequently and cloſely obſerved it, I was long perſuaded of the contrary, and inclined to conſider it as undeſcribed by that Author, had accordingly given in the title *reticulatus*, from characters more readily conſpicuous than that, on which the *linnæan* title *ſaccatus* is founded.

That the epithet *laxa*, *looſe* or *ſlack*, ſhould be applied to a covering ſo nicely fitted, ſo preciſely accommodated to the Animal, in the various ſhapes which it aſſumes; may I apprehend be accounted for, by ſuppoſing the imperfect preſervation of perhaps the only ſpecimen that Linnæus ever ſaw; to which the deſcription

§ ſaccatus 2. S. corpore tunica laxa induto. *Habitat in* Oceano Indico. Structura *refert antecedentem, præter cutim membranaceam laxam, diaphanam,* qua animal includitur. v. Lin. Syſt. Nat. T. I. 1078. 279. 2.	Cloaked T. the body cloathed with a looſe covering. Inhabits the indian Ocean. It reſembles the preceding, *(nudus)* but incloſed in a looſe, membranaceous, tranſparent pellicle.

deſcription and figure in the Amœnitates academicæ ‡ refer: the figure favors the ſuſpicion, by repreſenting the pellicle as if torn.

In ſuch as I have kept, I have frequently obſerved bliſters, which I have before || ſuppoſed uſual in Animals of this Genus; I ſuſpect theſe were increaſed by the putridity of the water.

It was in a ſtate of diſeaſe or diſſolution, that I particularly remarked a more than ordinary detachment of this covering; which upon trial eaſily ſeparated from the creature, tho' more adheſive towards the tail, and not without expence of ſome liquid, diffuſed in its ſeparation. The appearance of the anterior part of the worm after the loſs, was ſo much the ſame as before, that I think common obſervation would hardly have miſſed it.

In the Amœnitates academicæ ‡ this creature is numbered with *chineſe* rarities, and I believe few Authors have hitherto acknowledged it as an inhabitant of our own Seas.—I have however frequently met with it after rough weather, in the neighbourhood of this Place, where, according to my Obſervation it is conſtantly a larger Species than the *nudus*.

It is a noiſome Animal; the frequent offenſive ſmell which it emits in confinement, being no certain ſign of its being dead, but rather ſeeming to ariſe from its natural tendency to corrupt the water, and to retain the putrid ſtench, even after its removal out of it.

It will ſurvive a conſiderable degree of putridity in the water if not too long continued; for though it may bliſter, and protruding its mouth exhibit its laciniated Fauces; yet it is much but the very offenſive exhalations ſuggeſt the convenience of changing the water in due time for the preſervation of the Animal's life.

Should not this Worm and the S. *nudus*, on account of the laciniæ about the head, be rather ranked with the *Molluſca* than with the *Inteſtina?* If their

Gut-like

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‡ CHINENSIA LAGERSTRÖMIANA.

39. NEREIS (ſacculo induta.) *Fig.* 5.

Hoc animal maxime ſingulare, quaſi medium inter Hirudinem & Nereiden cæruleam, nitidum, altera extremitate attenuatum tubo cylindrico, brevi. *Corpus* conſtat cylindro craſſiore, induto membranæ pellucidæ, laxæ nec adhærenti, decuſſatim ſtriato; Hujus membranæ altera extremitas, animali interiori longior, ventricoſa, longitudinaliter ſtriata.

v. Amœn. academ. Vol. 4. p. 254, Tab. III. 5.

|| v. No. II. p. 4.

‡ CHINESE LAGERSTRÖM's COLLECTION.

39. Nereis (cloathed with a little bag). *Fig.* 5.

This very ſingular Animal, as it were the connecting Link between the Leech and the blue Nereis, is ſplendid; and tapering at one end into a ſhort cylindric Tube: The body is likewiſe cylindric but thicker; cloathed with a looſe tranſparent membrane, not adhering, ſtreaked croſſwiſe; at the further end longer than the Animal incloſed, ſwollen, and ſtreaked lengthwiſe.

Gut-like ſhape be objected, would not the ſame objection remove the HOLOTHURIA *inhærens* from its preſent place (No. 2811) in Muller's arrangement ?||

cute molli contegitur, tota incisvris conſtante os vel roſtrum obtuſum eſt, parumque prominet, unde μικρορυγχοτερον cognominavimus.

Aliis roſtrum deeſt, ſed foramē tantū habent, capeſſendi cibi gratia. Totus Vermis digitali eſt magnitudine minimique digiti craſſitudine.

v. Rondel de Inſect. & Zooph. Lib. 109.

It is covered with a ſoft ſkin, marked with numerous inciſures. The Mouth or Beak is obtuſe, and juts out but little, whence we have called it μικρορυγχοτερον, *which with the inſertion of a π, as before, may be underſtood ſmall-quill-ſnouted,* or *having a ſmall tubular ſnout.*

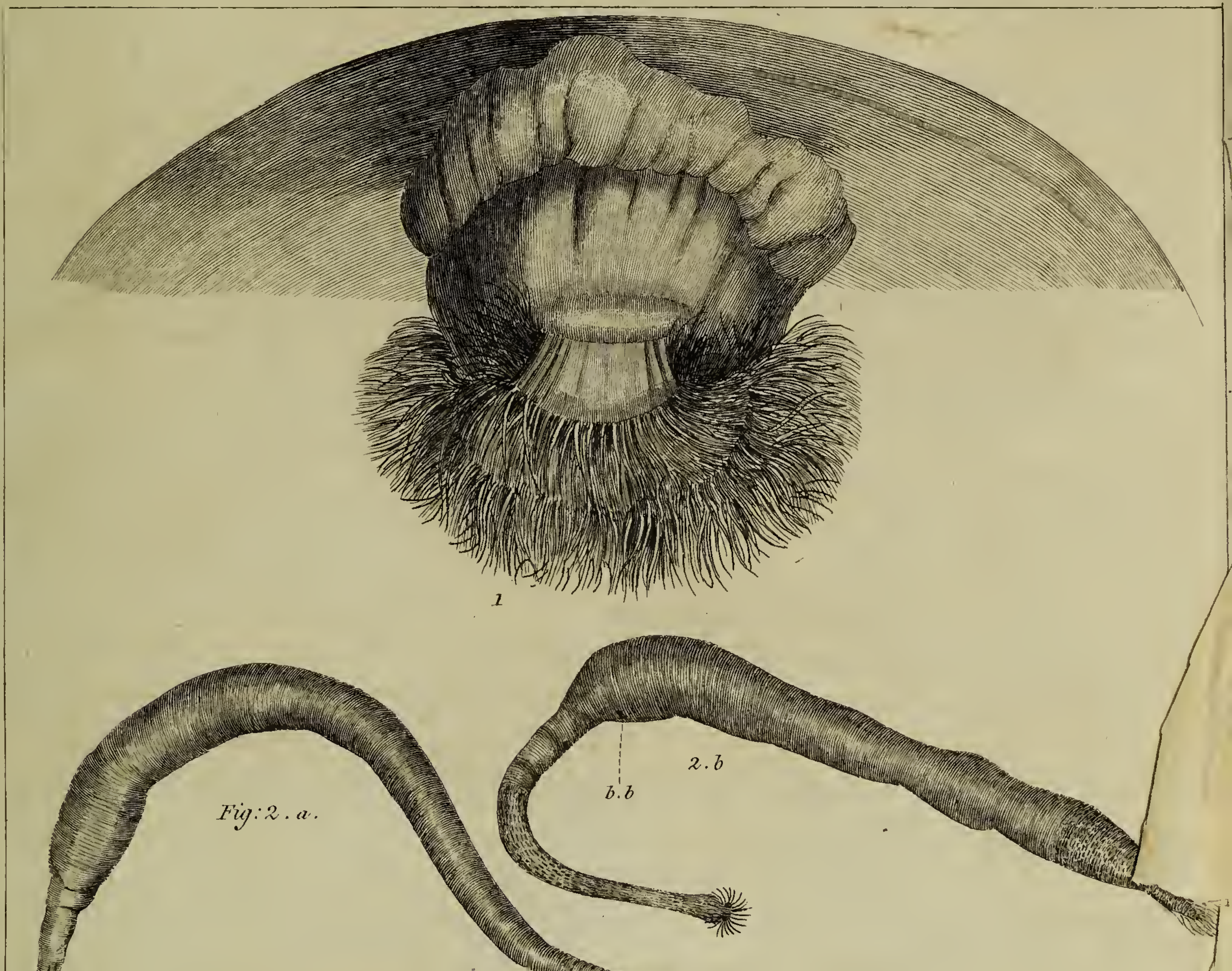
Others, wanting the beak, have only the hollow paſſage whereby to receive their food. The whole Worm is of a Finger's length, and of the thickneſs of a little finger.

||v. Muller Zool. dan. Prod. No. 2811. T. XXXI. f. 1—4.

TAB. I.

Fig. 1. of the ACTINIA *Caryophyllus* fixed to the ſide of the Baſon.
2. a of the SIPHUNCULUS *nudus* with the Mouth concealed.
2. b of ditto with the mouth extruded, the tail more ſwollen, and bearded.
2. c of ditto in a turgid ſtate.
3. of the SIPHUNCULUS *reticulatus*—ſaccatus Lin.

Pl. I



M.M. del:

Peter Mazell Sculp.

THE ſlight diſcuſſion of the *Subjects* in the few preceding pages, may aſſiſt in awakening our ſurpriſe, that two races of Animals, as diſtinct as thoſe of INSECTS* and WORMS, ſhould have been ſo much confounded by the reciprocal miſapplication of their titles; to which the appearance of certain Inſects in the Larva, and our too general neglect of things which we inadvertently conſider as beneath our notice, have probably contributed.

But in fact nothing created *is* beneath our notice; for whether we contemplate the ethereal regions, and from the Spheres therein revolving, derive an accreted conviction that doubtleſs there is a Supreme Being who governs the Univerſe; or from the nearer ſurvey of things more immediately about us, increaſe our proper confidence in his particular Providence, which the much neglected Lillies of the Field, are if duly conſidered abundantly ſufficient to teſtify; we are benefited in either caſe.

And as with the help of glaſſes, we proceed in inveſtigating more minutely, we receive reiterated aſſurances of theſe univerſally atteſted truths; we learn to lay aſide our prejudices, and to admire what we before deſpiſed.

The advantages which have in this age accrued to natural hiſtory, from the attention that has been paid to minute characters, give encouragement to our perſeverance.

The Antennæ of INSECTS, complicated, various, and exquiſite in ſtructure, have largely contributed to the method, which at preſent illumines their hiſtory; but our curioſity with reſpect to the particular uſes of theſe delicate inſtruments, remains unſatisfied.

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* INSECTA.	* INSECTS.
ANIMALCULA polypoda, *Spiraculis* lateralibus reſpirantia, *Cute* oſſea cataphracta; - - - - - - - -	ANIMALS of a ſmall ſize furniſhed with ſeveral feet, breathing thro' lateral Spiracula, and defended with a hard ſkin like a Coat of Mail. - -
CORPUS horum dividitur in *Caput*, *Truncum*, *Abdomen*, *Artus*:	Their Body divided into Head, Trunk, Abdomen, and Limbs:
CAPUT pleriſque diſtinctum, *inſtruitur* Oculis, *Antenis*, ſæpinſque Ore; - - - -	The Head in moſt is diſtinct, and furniſhed with Eyes, Antennæ, and moſt commonly with a Mouth. - - - - - - - -
v. Lin. Syſt. Nat. Tom. I. p. 533, &c.	

Compare with the linnæan account of VERMES.

The pectinated Antennæ which diſtinguiſh ſome kinds of Moths, eſpecially the Males; are doubtleſs adapted to their peculiar exigencies: Now if we may be allowed to conjecture that the branches of theſe by communication with, and through the common Stem, convey to the Senſorium, the vibration of ſounds, or perception of ſmells, which in their various inclinations multiplied by the general inflections given by the Inſect to the whole, they may be ſuppoſed capable of receiving; what an idea does this encourage, of their acute and extenſive ſenſibility.

I recollect a Moth of this kind flying into the houſe, and as it continued fluttering about, I ſoon ſuſpected its viſit might be owing to another of the ſame Species, being recently emerged from a chryſalis which I had ſhut up in a box: on examining the box I found the Moth which I expected; and on introducing them to each other, had reaſon to think my ſuſpicions as to the occaſion of the viſit, well founded. Mr. Harris's explanation of the curious art of ſembling, a method of decoying male Moths with a female confined,§ favors the credibility of this account.

By what ſenſe can we conceive theſe Moths thus directed, ſo likely as by that of ſmell? where then may we trace the organs of this ſenſe? in the Antennæ? in the Palpi? or where?

That the Inſects juſt mentioned which appear to poſſeſs this ſenſe in ſo eminent a degree, have alſo ſuch remarkable Antennæ ſeems in favor of the former ſuppoſition; But as in many Species, theſe inſtruments are ſo delicately extended, muſt not the tremulous motion of the air occaſioned by ſounds, neceſſarily affect them? And if ſo ſhall we ſuppoſe them the compound vehicles of two diſtinct Senſes, and attribute none to the Palpi? for the idea of the latter being *Feelers*, I confeſs I do not rightly underſtand. I have frequently amuſed myſelf with obſerving, and ſometimes with drawing the Antennæ of dipterous Inſects; and ſhould think that in their great variety, ſome good characters for the better diviſion of this Claſs, might be found.

For the examination of theſe, and ſuch like minutiæ, a pocket magnifier for the fields, and a microſcope at home, are ready Aſſiſtants; and in order to draw them more eaſily, I would recommend a ſmall Camera to be uſed with the ſolar Microſcope, conſtructed ſomewhat in the following manner.

A ſmall oblong box, of proportionate width and breadth,* open at one end; towards the other end place a piece of looking-glaſs at an angle of 45, over which

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§ v. Har. p. 53.

* The ſize or proportion of the box may be varied according to the intended uſe; or as the materials are cheap and obvious, it may be ſtill more convenient to have two or three of different ſizes: mine is about ſix inches long, upwards of three inches wide, and above two inches high in the clear.

which lay a piece of plain glaſs and upon this a piece of thin oiled paper, all which ſhould be ſo exactly fitted as for the oiled paper to lie juſt level with the edges of the box, and to be kept ſteady by the hinder part of the cover, when ſhut and faſtened down : this hinder part of the cover for a little more than half the length, being made to turn back on a hinge towards the front ; and having a circular hole about the middle of it, an inch or more in diameter.

In uſing this box at about two or three feet diſtance from the microſcope, more or leſs according to the ſize of the object, or otherwiſe at diſcretion, and adjuſting the Focus accordingly ; place it ſo, as that the ſhadow of the object may be received through the open end, reflected by the ſpeculum through the piece of plain glaſs, and appear on the oiled paper within the circle : then trace the outline with a pencil, and expreſs it as exactly as may be on a piece of proper paper ; after which finiſh ſhading, &c. by imitation from the common microſcope.

By due regard to natural characters, we may hope to increaſe our knowledge of natural ſubjects ; and if we deſire to preſerve, and communicate clear ideas of things, we ſhould cautiouſly guard againſt miſnomers : Inſects therefore ſhould no longer in any ſtate be called Worms, nor Worms Inſects ; neither ſhould Lobſters, Crabs, Shrimps, Oyſters, Cockles, Muſcles, &c. be confounded with Fiſh ; ſince the three firſt are acknowledged as INSECTS, and the latter more properly included amongſt the WORMS.

No. IV. vide Tab. II. Fig. 1 a. 1. b. and 1. c. ?

ASTACUS.

* STRIGOSUS. Loricatus, rugoſus, ſpinoſus; *Chelis* antice multidentatis: *Pedibus* poſticis brevioribus; plicatilibus; apice muticis villoſiſque.

LOBSTER.

* PLATED.— Loricated, rugoſe, ſpinoſe; *Claws* with many teeth in front. Hind *Legs* ſhorter, folding; with talonleſs villoſe Feet.

Hæc Species formoſiſſima eſt; Cauda cæruleo lucide ſplendet; Chelæ, Brachia, & Femora, ſquamoſæ ſunt; Chelæ Pedeſque ad ungues rubro tinguntur: Squamæ, nec non laminæ Teſtæ ciliatæ.

* * * * * * * * * * * * *

THIS very beautiful Species exhibits ſome ſtriking peculiarities; the Tail is variegated with bright blue, and the Claws and Feet towards the Talons, with coral red: The Arms, the Claws, and the Legs about the Thighs, are defended with ſcales, which ſcales are ciliated, as are alſo the plates of the thoracic Cruſt.

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* It being conſiſtent with, if not neceſſary to my preſent plan, to point out the place and characters which Linnæus has in his Syſtem aſſigned to the preſent ſubject, and conſequently to enter ſomewhat more largely on the linnæan characters of INSECTS; I hope my reader will excuſe the recapitulation of a few already pointed out in Note * p. 9.

INSECTA.

ANIMALCULA polypoda, *Spiraculis* lateralibus reſpirantia, Cute oſſea cataphracta; *Antennis* mobilibus ſenſoriis capitis inſtruuntur.

CORPUS horum dividitur in *Caput*, *Truncum*, *Abdomen*, *Artus*.

CAPUT plerìſque diſtinctum, *inſtruitur* Oculis, Antenis, ſæpiuſque Ore; *deſtituitur* Cerebro, Naribus, Auribus.

Oculi pleriſque bini, abſque palpebris, ſimplices aut compoſiti, quibus vident colores.

Antennæ binæ, articulatæ, ſenſu nobis ignoto. - - - - - - - - - - - - - - - - -

Palpi articulati, ori affixi, pleriſque quatuor ſ. ſex:

Os pleriſque ſub capite, quibuſdam in pectore; *Roſtro*, *Labio*, *Maxillis* tranſverſis, *Dentibus*, *Lingua*, *Palato*; nonnullis os nullum.

Stemmata verticis puncta tria elevata nitida.

INSECTS.

ANIMALS of a ſmall ſize, furniſhed with ſeveral Legs, breathing through lateral *Spiracula*, and defended with a hard Skin like a Coat of Mail; their Heads ornamented with ſenſitive, moveable Antennæ.

The BODY divided into *Head*, *Trunk*, *Abdomen*, and *Limbs*.

The HEAD in moſt diſtinct, *furniſhed* with Eyes, Antennæ, and moſt commonly with a Mouth; but *deſtitute* of Brain, Noſtrils, Ears.

Eyes in moſt, two, without Eyelids, ſimple, or compound, with which they ſee colors.

Antennæ two, jointed; Vehicles of a Senſe to us unknown. - - - - - - - - - - - - - - - - - - -

Palpi jointed, fixed to the Mouth, in moſt 4. or 6.

Mouth in moſt under the Head, in ſome in the Breaſt; with *Beak*, *Lip*, and tranſverſe *Jaws*, *Teeth* *Tongue*, *Palate*: Some without Mouth.

Stemmata three ſhining raiſed dots on the top of the Head.

When the Claws are examined in front, they ſtrikingly reſemble the jaws of a Quadruped, furniſhed not only with grinders, but having moreover four or five Teeth towards the tip, ſo placed, as that when the Claws are ſhut, the four front teeth of one, occupy the interſpaces of the five front teeth of the other Claw; and ſo contrariwiſe, three of theſe latter, the vacancies between the four.

Another particular character is derived from the additional pair of Legs, already hinted at in the ſhort deſcription; a character not wholly confined to this Species,

as

TRUNCUS, inter Caput & Abdomen, pedatus, *Thorace* ſupra *Dorſo*, poſtice *Scutello*, ſubtus *Pectore Sternoque.*	TRUNK between the Head and Abdomen, whence proceed the Legs, the upper part the *Thorax*, behind, the *Eſcutcheon*, beneath the *Breaſt*, and *Sternum.*
ABDOMEN Ventriculo, Inteſtinis, Viſceribuſque fœtum, inciſuris 5, annulatum, *Spiraculis* poroſis lateribus pertuſum, ſupra *Tergo*, ſubtus *Ventre*, poſtice *Ano* terminatum.	ABDOMEN containing the Stomach and Entrails, annulated, with five ſections, pierced with lateral pervious *Spiracula*; above *Back*, beneath *Belly*, *Anus* behind.
ARTUS ſunt *Cauda*, *Pedes*, plurimiſque *Alæ*:	The LIMBS are the *Tail*, *Legs*, and in moſt the *Wings*.
Cauda abdomen terminans, - - - - -	The *Tail* terminates the *Abdomen*, - - -
Pedes Trunci Femoribus, *Tibiis*, Plantæ *Tarſis*, Digitis *Unguibus*; Manus *(Chela)* nonnullis, ſimplex Pollice mobili; Poſteriores pro uſu *curſorii*, *ſaltatorii*, *natatorii*.	The *Legs* proceeding from the Trunk are formed with Thighs, *Shanks*, *Feet*, Toes, *Talons*; ſome have a Hand (or Claw) with a ſingle piece or Finger, and a moveable Thumb; the hind Legs are variouſly conſtructed for *running*, *leaping*, *ſwimming*.
Alæ duæ ſ. quatuor - - - - -	The *Wings* are in number two or four - -
Elytra (alæ ſuperiores) cruſtacea bina, ſæpius mobilia - - - - tegentia alas inferiores.	The *Wing-Sheaths* (upper Wings) are cruſtaceous, two in number, moſt commonly moveable - - - covering the under Wings.
Hemelytra media quaſi alas inter & elytra.	The *Half-Sheaths* are as it were of a middle conſtruction, between Wings and Wing-Sheaths.
Halteres ſub alis dipterorum ex petiolo capitati.	The *Poiſers* are petiolated knobs under the Wings of dipterous Inſects.
SEXUS *Mas* & *Femina* generant perfecta.	The SEXES are *male* and *female* producing their kind.
Neutra nonnullis ſocietate fœderatis.	*Neuters* are found among ſome Inſects which live in confederate Societies.
METAMORPHOSIS plurimis triplex, mutanda ſtructura, exutis ovi tunicis una poſt alteram.	The METAMORPHOSIS of Inſects is generally three fold; their form being to be changed, by ſucceſſively putting off the inner ſkins of the egg.
Ovum ſub minima mole veſicaria excluditur.	The EGG is excluded under a ſmall bladder-like appearance.
LARVA (Eruca) ſuccoſa, mollior, major, aptera, ſterilis, tardior, apoda ſæpe, ſæpeque polypoda, vorax alimento proprio.	The LARVA (Eruca) is ſucculent, apterous, & barren; comparatively ſoft, large, and ſlow; often legleſs, and often many legged, voracious of its peculiar food.
PUPA (Nympha) ſiccior, coarctata, durior, *nuda* ſ. *folliculata*, ſæpe abſque ore, quæ vel *Pedata* 1. 2. 3. vel *Apoda* 4. 5.	The PUPA (Nympha) comparatively dry, and hard, contracted, *naked*, or *cloathed*, often without a Mouth, and either *furniſhed with Legs* as 1. 2. 3. or *legleſs* as 4. 5.
1. *Completa* omnibus partibus agilis, (Aranea, Acarus, Oniſcus).	1. *Complete* active with all its parts, (Aranea, Acarus, Oniſcus.)
2. *Semicompleta* ſolis alarum rudimentis. (Gryllus, Cicada, Cimex, Libellula, Ephemera.)	2. *Semicomplete* with the rudiments only of Wings. (Gryllus, Cicada, Cimex, Libellula, Ephemera.)
3. *Incompleta* alis pedibuſque immobilis. (Apis, Formica, Tipula.)	3. *Incomplete* with Wings and Legs immoveable. (Apis, Formica, Tipula.)
4. *Obtecta*	4. *Protected*

as I may hereafter have occaſion to obſerve: theſe Legs when folded, lie ſo compactly againſt the Sides, as readily to paſs undetected; it is therefore the leſs to

4. *Obtecta* thorace abdomineque diſtincto corticata: (Lepidoptera) eaque vel nuda, vel folliculata.

5. *Coarctata* intra globum. (Muſca, Oeſtrus.)

IMAGO revelata, declarata, perfecta generans, agilis, antennis inſtructa.
triplex itaque ſtructura & cognitio ejuſdem animalis.

HÆC *Muta*, niſi alio proprio inſtrumento ſonora; *Surda*, ſtridorem ætheris licet percipiant; *Plura* ubique plantarum ſpeciebus, ſed ob patentiorem ſibi regionem in orbe pauciora: *Tropica*, *Arctica* & hodie ignota *Antarctica*; ſingula demum *Minima*, annua, exceptis aquaticis, ſed univerſa maxima moles animantia, effectuque pariter maxima, ſed magis occulto magiſque diſperſo, ideoque minus coërcendo; totidem etenim ſunt Naturæ annui miniſtri, propriis negotiis peragendis præfixi, quot muniis ſufficiant, proportionem inter plantas ſervando, erronea, ſuperflua, mortua, putrida conſumendo, aliis demum, imprimis avibus, in alimentum cedendo.

HABITANT inſecta in iis tantum plantis, e quibus victitant non in quibus occurrunt, unde ſæpius nomina *Trivialia* optima, ut ars cum *Politia naturæ* combinetur; -

ORDINES inſectorum ab alis deſumſi.

Alæ 4		Superiores cruſtaceæ ſutura recta	*Coleoptera* 1.
		ſemicruſtaceæ incumbentes	*Hemiptera* 2.
	Omnes	imbricatæ ſquamis	*Lepioptera* 3.
		membranaceæ ano inermi	*Neuroptera* 4.
		aculeato	*Hymenoptera* 5.
Alæ 2, Halteres loco poſticarum. - - -			*Diptera*. 6.
Alæ o. ſ. abſque Alis & Elytris			*Aptera* 7.

4. *Protected* with Thorax and Abdomen diſtinct incloſed in a hard ſkin: (lepidopterous) and theſe are either naked, or cloathed.

5. *Contracted* within a ſmall compaſs. (Muſca, Oeſtrus.)

IMAGO unveiled, conſpicuous, productive, active, furniſhed with Antennæ. As therefore the Form, ſo alſo neceſſarily, the knowledge of the ſame animal is threefold.

INSECTS are *mute*, unleſs otherwiſe provided with ſome Inſtrument, adapted to emit ſounds; they are *deaf*, altho' they perceive the agitation of the air; they are every where more numerous than the Species of Plants; but fewer in proportion to their extenſive range: There are *Inſects* peculiar to the Tropics, to the northern, and the ſouthern regions; (the latter as yet unknown;) ſeparately they are very ſmall, and aquatics excepted, annual; but univerſally enlivening a very great extent, and being themſelves in like manner very great, in the effect which they produce, (which effect the more it is concealed, and the more diſperſed, is the leſs to be prevented; for theſe annual Servants of Nature, having each their proper taſks aſſigned them, are in number proportionate to the offices required;) by preſerving the due proportion amongſt Plants; by conſuming rubbiſhy, ſuperfluous, dead, and putrid matter, aud finally, by affording nouriſhment to other Creatures, eſpecially to Birds.

INSECTS are properly ſaid to inhabit thoſe plants only on which they feed, not thoſe on which they are caſually found; hence frequently the beſt *trivial* Names are aſſigned, when in their artificial conſtruction, they are made to accord with the conſtitution of Nature. -

I have choſen the characters of the ORDERS of Inſects from the Wings.

4 Wings.		Upper Wings cruſtaceous, with a ſtrait ſuture,	Coleopterous. 1.
		ſemicruſtaceous incumbent,	Hemipterous. 2.
	All	imbricated with ſcales,	Lepidopterous. 3.
		membranaceous Tail without ſting,	Neuropterous. 4.
		Tail with a ſting,	Hymenopterous. 5.
2 Wings.		Poiſers in lieu of hind Wings,	Dipterous. 6.
No Wings.		Without either Wings or Wing-ſheaths,	Apterous. 7.

be wondered at that Mr. Pennant, § ſhould overlook them, tho' the linnæan deſcription* might have aſſiſted him in their diſcovery.

A material uſe of theſe additional limbs, ſeems to be to cleanſe the Creature from contracted filth, and to expel Monoculi or ſuch like Intruders from the foliations of its Shell, which foliations are very remarkable, whence the name ſtrigoſus is probably derived.

But all theſe particular characters conſidered in the lump, do not in my opinion ſo far contradict it's general appearance, as to authorize it's ſeparation from the *Aſtacus* or *Lobſter* tribe, to which Mr. Pennant has referred it: Dr. Fabricius† has ſeparated it from them. I do not here pretend to determine as to the ſufficiency or inſufficiency of his grounds.

It

INSECTA APTERA.	APTEROUS INSECTS.
270. CANCER. *Pedes* VIII (10 ſ. *6 raro)* inſuper Manus 2 chelatæ. *Oculi* II, diſtantes, plerique pedunculati; elongati, mobiles. *Palpi* II, cheliferi. *Cauda* articulata, inermis.	270. CRAB. *Legs* VIII. (10 or 6 rarely) beſides 2 Hands furniſhed with forcipated Claws *Eyes* II. diſtant, in moſt pedunculated; long, moveable. *Palpi* II. having Claws. *Tail* jointed, weaponleſs.
h *Macrouri thorace inæquali.*	*h* *Long-tailed, with uneven Thorax.*
ſtrigoſus. 69. C. macrourus, thorace antrorſum rugoſo ſpinis ciliato, roſtro acuto ſeptemdentato. - - - - - -	plated. Cr. long-tailed, Thorax rugoſe towards the front ciliated with ſpines, with a ſharp 7-toothed Beak. - - - -
- - - - - - -	- - - - - - -
Habitat in Oceano Atlantico, Mediterraneo. - - - - - -	*Inhabits* the atlantic and mediterranean *Seas.* - - - - - -
- - - - - - -	- - - - - - -
- - - - Pedes *præterea* 3 *utrinque*; *quartum par minutum, apice muticum, villoſum.*	- - - - beſides the three Legs on each ſide; it has a fourth ſmaller pair, talonleſs, and villoſe at the tip.

v. Lin. Syſt. Nat. p. 533. 536. 1038. 1052. 1053.

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§ v. brit. Zool. Vol. iv. p. 18. No. 26.

* v. Note above.

† INSECTORUM IV. AGONATA.	† INSECTS Claſs IV.
Os palpis quatuor aut ſex. *Maxilla inferior nulla.*	*Mouth furniſhed with 4 or 6 Palpi.* *No under Jaw.*
126. PAGURUS. *Antennae* quatuor pedunculatae inaequales: anteriores ſetaceae, poſteriores filiformes, articulo ultimo bifido.	126. PAGURUS. Antennæ four, pedunculated unequal: anterior ſetaceous, poſterior filiform; the laſt joint bifid.
- - - - - - -	- - - - - - -
ſtrigoſus. 10. - - - - - - -	Strigoſus 10. - - - - - - -
- - - - - - -	- - - - - - -
Habitus ab hoc genere omnino differt, at charactere junguntur.	In faſhion totally different to this Genus, but connected by character.

v. Fabricii Syſt. Entom. p. 399, 410, 412.

Although

It is pretty commonly taken by the Prawners amongſt the rocks of this Coaſt.

Though ſo ſpinous and rough in its adult ſtate, I am yet inclined to conſider as the ſame Species, but younger, a ſmall one which was brought me amongſt Dredgings from the Sea, and which at that time (about Jan. 1781) I conſidered as a newly diſcovered Species, and named and deſcribed it accordingly.

It is proper to obſerve that though in my Notes I find I have called it hexapus, yet by the figure it appears to have been alſo furniſhed with the two ſhort hind Legs, which I ſuppoſe at the time I took the Drawing, I did not know to be ſuch.

It was a very pretty little creature, beautifully variegated with fuſcous, blue, yellow, and white. The Antennæ being fragile, it had loſt the greater part of one of them, but I obſerved that it uſually kept the other turned backwards; occaſionally moving it about, as if to feel or ſmell out food, in the Saucer in which I kept it ſupplied with Sea water.

I put the end of a feather into the water, to try if the motion occaſioned would be perceived by the Animal; on ſo doing, the Antenna was directed to-

Although I believe the opinion that LOBSTERS and CRABS properly belong to the Claſs of INSECTS, is pretty well eſtabliſhed amongſt Naturaliſts; yet it may not be amiſs to attend to the following Obſervations of Dr. Baſter which contain ſome ſtrong reaſons in favour of this opinion.

Aſtaci, Cancri & alia hujus generis animalia, a LINNÆO Inſectis merito accenſentur, quia quinque illas præcipuas, quæ Inſecta ab aliis animantibus, diſcernunt habent proprietates: Veluti quod.

Primo. Antennis inſtructi ſunt. *Secundo,* Quod cutem habeant cruſtaceam & intus oſſibus ſive ſpinis, quæ in animalibus quadrupedibus, avibus, piſcibus & Amphiliis deprehenduntur plane carent. *Tertio.* Quod maxillas non ſurſum & deorſum ſed tranſverſim aperiunt. *Quarto.* Quod nullis ad oculos claudendos palpebris præditi, membranam corneam in varias diviſam habent ſuperficies. *Quinto.* Quod non per naſum, quo Inſecta carent, ſed per aperturas quaſdam laterales aërem ſpirant.

Verum LINNÆUS Aſtacos & Cancros ad unum, idemque genus refert: Aſtacos Cancros macro-uros, alios vero Cancros brachy-uros vocans; et unum eorum characterem aſſignat, quod duas habeant clelas et octo pedes, quod in omnibus non obtinet: Inter Aſtacos enim quidam inveniuntur, decem pedibus præter chelas inſtructi, & alii ſex tantum pedibus præditi; Neque aliter ſe res habet in cancris: *Cancer* enim *perverſus* decem, *Cancer ſpinoſus maximus,* præter chelas non niſi ſex habet pedes, ita ut ex pedum numero certum horum animalium characterem petere nequeas, cum altera alterum quatuor pedum numero ſuperet.

v. Baſt. Opuſc. ſubſec. TOM. II. p. 5. 6.

Lobſters, Crabs and other animals of this race, have been by Linnæus rightly reckoned amongſt Inſects, as poſſeſſing five principal properties which diſtinguiſh Inſects from other Animals as for example.

Firſt, They are furniſhed with Antennæ. *Secondly,* They have a cruſtaceous Skin but no internal bones, backbone nor others, which are found in Quadrupeds, Birds, Fiſhes, and Amphibia. *Thirdly,* That they open their Jaws, not upwards and downwards, but tranſverſely. *Fourthly,* That they have no eye-lids to cloſe their Eyes, but theſe are defended with an horny membrane divided into various ſurfaces, diverſly inclined. *Fifthly,* That they do not breathe through the Noſe (which Inſects have not) but through certain apertures in the Sides.

But Linnæus has referred Lobſters and Crabs to one, and the ſame Genus: calling Lobſters Cancri macrouri (or long-tailed Crabs), and Crabs (properly ſo called) brachyuri (or ſhort-tailed); and has aſſigned as a common character that they have two Claws and eight Legs, which does not hold good in all: For there are ſome found amongſt Lobſters, which have ten Legs beſides the Claws, and others again have only ſix Legs: and ſo amongſt Crabs: for the *Cancer perverſus* has ten, and the *Cancer ſpinoſus maximus* (horridus ?) has only ſix Legs beſides the Claws; ſo that one cannot from the number of the Legs obtain a certain character, whereby to diſtinguiſh theſe Animals, ſince one may be found provided with four Legs more than another.

wards the place, as if to enquire into the cauſe of the perturbation; and moving the feather in different directions, I obſerved the Antennæ followed, as if attracted by, altho' not in contact with it.

If this was a young *ſtrigoſus*, I ſuſpect I have alſo ſeen this Species in an intermediate ſtate, in which it was leſs conſpicuouſly variegated than in this, and conſiderably leſs rough than the larger one.

As amongſt Spiders, ‡ ſo alſo I ſuſpect amongſt Crabs, the Species are liable to be confounded by us, on account of their different appearances at different ages; eſpecially if as I incline to think, they are capable of breeding, previous to their complete form and growth.

‡ v. Lin. Syſt. Nat. T. 1. p. 1032. Note.

No. V. v. Tab. II. Fig. 2 a 2 b?

CASSIDA	TORTOISE-BEETLE
*VIRIDIS. C. ſuperne viridis, Corpore inferne nigro; Teſta viridi ſuperincumbente.	GREEN. T-B. above green; *Body* beneath black; with the green ſhell hanging over.
LARVA hexapoda, depreſſa, aſelliformis, obſcure vireſcens; lateribus ſpinoſis.	LARVA hexapod, flat, Woodlouſe-like, dull green; ſpinoſe at the ſides.
Stercore Candæ adhærenti, ſe obtegens.	Concealing itſelf with its dung, ſticking to the Tail.
PUPA fuſca, quieſcens; Larvæ ſimillima.	PUPA quieſcent, fuſcous; very like the Larva.

THIS pretty Inſect, being ſo nearly of a color with the Plants on which it uſually feeds, and moreover of a very quiet diſpoſition, is eaſily overlooked; I believe that it feeds on the ſame Plants, in the different ſtates of LARVA and IMAGO. I recol-

* INSECTA COLEOPTERA.	* COLEOPTEROUS INSECTS.
CASSIDA *Antennæ* ſubfiliformes, extrorſum craſſiores	TORTOISE-BEETLE. *Antennæ* ſubfiliform thickeſt towards the end.
Elytra marginata	*Wing-ſheaths* margined.
Caput ſub thoracis clypeo plano reconditum.	*Head* covered by the flat thoracic plate.
viridis. 1. C. viridis.	green. T-B. green.
Habitat in Plantis verticillatis Europæ.	*Inhabits* verticillate *Plants* of Europe.

v. Lin. Syſt. Nat. p. 574, 575.

I recollect I found it in the Larva ſtate on a Species of *Water Mint?* a piece of which Plant I put into a Phial with Water, and ſet it on a ſhelf in my Study; the allurements of this food were ſufficient to detain it; it readily underwent its different changes; nor did even the Imago quit the place, and ſeldom if ever voluntarily the Plant, for a conſiderable time.

Inſects, like Plants, are ſubject to many Varieties; theſe I ſuſpect in a great meaſure depend on the ſtate of the Weather about the time of their metamorphoſis; and that a particular hot and dry Seaſon about that time, is peculiarly favorable to their luxuriance.

Scopoli ‡ has made mention of a Variety of this Inſect red about the Eſcutcheon; My Son LINNÆUS has laſt Summer (1786) brought me one which was alſo reddiſh about the Eſcutcheon, with the addition of ſome lucid bluiſh ſpots, near the thoracic junction.

The latin generic name Caſſida, ſignifies a helmet; and has I ſuppoſe been given to this Inſect on account of the remarkable protection which the thoracic plate affords to the head; that the engliſh title Tortoiſe Beetle is derived from its ſimilitude to a Tortoiſe, from its overhanging Shell &c; and that its ſpecific titles in both languages ariſe from its predominant color.

I have

INSECTORUM	INSECTS.
I. ELEUTERATA.	CLASS I.
Os palpis quatuor aut ſex.	Mouth with four or ſix Palpi.
Maxilla inferior nuda, libera.	Under Jaw naked, free.
26. CASSIDA. *Palpi* anteriores clavati: poſteriores filiformes.	26. TORTOISE-BEETLE. Anterior *Palpi* clavated: poſterior filiform.
Labium elongatum integrum.	*Lip* elongated, entire.
Antennæ moniliformes.	*Antennæ* moniliform.
viridis 1. C. viridis corpore nigro.	green 1. T-B. green; Body black.
Larva - - - - - - - - - - - cauda biſeta - - - - -	Larva - - - - - - - - - - Tail like two briſtles. - - -

v. Fabr. Syſt. Entom. p. 88, &c.

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‡ ORDO I.	‡ ORDER I.
COLEOPTERA.	COLEOPTEROUS.
ALÆ QUATUOR: SUPERIORES CRUSTACEÆ.	FOUR WINGS: UPPER WINGS CRUSTACEOUS.
CASSIDA.	
Caput ſub thoracis clypeo plano reconditum.	Head covered by the flat thoracic plate.
117. CASSIDA *Viridis*.	117. green TORTOISE-BEETLE.
- - variat elytri angulo ſcutelli rubro.	Variety red about the junction of the Eſcutcheon and Wing-ſheaths.

v. Scopoli Entom. carniol. 117. &c.

I have found it on Thiſtles as well as on the *Water Mint?* before mentioned; and according to Linnæus § it alſo inhabits other Plants.

SECTIO PRIMA CLASSIS INSECTORUM.	|| FIRST SECTION OF THE CLASS OF INSECTS.
COLEOPTERA INSECTA.	*COLEOPTEROUS INSECTS.*
Articulus Primus. Coleoptris integris duris.	Div. I. With entire hard Wing-Sheaths.
Ordo Secundus. Tarſorum articulis quatuor.	Order II. Feet with 4 joints.
Cassida. Antennæ extrorſum craſſiores, nodoſæ: thorax & elytra marginata: caput thorace tectum.	Tortoise-Beetle. Antennæ outwardly thicker, & knotty; Thorax and Wing-Sheaths bordered: Head covered by the Thorax.
1. CASSIDA *viridis, corpore nigro.*	1. *green.*

v. Geoffroy. T. 1. p. 312 &c.

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§ 467. - - - - - - - - - - - - - in Hortis in *Lycopo, Mentha* & aliis.	§ 467. - - - - - - - - - - - - - in Gardens upon Water Horehound, Mint and other Plants.

v. Lin. Faun. ſuec.

No. VI.

CASSIDA. TORTOISE-BEETLE.

No. VI. v. Tab. II. Fig. 3 a. 3 b?

CASSIDA.	TORTOISE-BEETLE.
* MACULATA. C. Superne rubra, nigro maculata; macula diſcali Elytrorum elongata.	* SPOTTED. T-B. above red, ſpotted with black; each Wing-ſheath marked with a long diſcal ſpot.
LARVA hexapoda, depreſſa, ſpinoſa, viridis; lineis dorſalibus tribus, mediâ dilatabili. Exuvio Caudæ adhærenti ſe obtegens.	LARVA hexapod, depreſſed, ſpinoſe, green; with three dorſal lines, the middle one dilatable. Concealing itſelf with an old caſt off ſkin adhering to it's Tail.
PUPA viridis, Larvæ ſimilis at Humerale latiore.	PUPA green; like the Larva, but with a wider thoracic plate.

* * * * * * * * * * * * *

THIS Species is larger than the green one, and appears to be much more choice in its food.

Geoffroy † ſpeaks of ſome which he ſuppoſes of the ſame Species, which were green inſtead of red: I have a diſtant recollection, of having myſelf obtained one, from a Larva which I had confined.

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* murræa. 2. C. nigra, clypeo rubro, elytris ſanguineis: punctis nigris ſparſis. *Habitat Gœttingæ in* Helenio. *J. A. Murray.* Statura *C. viridis. Elytra ſubſtriata punctis* 3. *ſ.* 5. *nigris ad ſuturam & unico ad baſin maximo; reliquis in diſco.*	Murray 2. T-B. black, thoracic Plate red, Wing-Sheaths blood colored; ſpeckled with black. *Inhabits the* - - Elecampane *at Gottingen. J. A. Murray.* Size of the *green Tortoiſe-Beetle. Wing-Sheaths ſubſtriated, with* 3. *or* 5. *black dots at the ſuture and a ſingle large one at the baſe; the reſt diſcal.*

v. Lin. Syſt. Nat. Inſ. 575.

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§ Caſſida.	Tortoiſe-Beetle.
murraea. 10. - - - - - - -	Murray - - - - - - - -

v. Fabr. Syſt. Entom. 90.

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† 5. CASSIDA *viridis maculis nigris variegata.* *Caſſida rubra, maculis nigris variegata.*	5. TORTOISE-BEETLE green; variegated with black ſpots. Tortoiſe-Beetle red; variegated with black ſpots.

Geoffroy's idea, that this difference of color is induced by age, appears to me very probable. The Coccinella 7-*punctata* at firſt emerging from the Pupa, is yellow; but after expoſure to light and heat, paſſes through ſhades of orange & minium, and gradually ripens to a vermilion red. May not this be ſuppoſed to ariſe in ſome meaſure, from the evaporation of ſuperabundant moiſture, and the conſequent inſpiſſation, or rather concretion of juices, whence the color is principally derived? The change however from green to red appears to me a more extraordinary one in an *Inſect*.

I have frequently found the Larva of this Species on the Inula *dyſenterica*, (*dyſenteric* Elecampane,) the only Plant that I recollect to have ſeen it on: On the ſame plant I have alſo found it in the ſtate of Imago. I ſuppoſe therefore that this plant affords it nouriſhment in both ſtates; the analogy of the *green* Tortoiſe-Beetle favors the ſuppoſition, which is alſo conſiſtent with Fabricius' ‡ account of this Genus.

In the Syſtem of this Author and in the linnæan, the murræa or red one, and the maculata or green one, are treated of as diſtinct; it is remarkable that Fabricius || has inclined to ſuppoſe the latter a mere variety of the Caſſida *viridis*; the very different habitation of their reſpective Larvæ, may I think, abundantly ſerve to defeat this Idea: In ſhort, it appears to me pretty evident that the *murræa* & *maculata* are one and the ſame Species, and that this Species is moſt clearly pointed out by the latter title which ſignifies *ſpotted*, and is therefore characteriſtic of both Varieties.

No. VII.

Je joins enſemble ces deux variétés, qui ſont tout-à-fait ſemblables, & qui ne différent que pour le fond de la conleur - - - - - - - - - - - - - - - - - - -	I join theſe two varieties, which are altogether alike, differing only in the Fond of their Color - - - - - - - - - - - - - -
On trouve ces deux inſectes enſemble, en grande quantité au bord des étangs, ſur l'aunée des prés. Leurs larves reſſemblent à celle de la caſſide verte. - - - - - - - - - - - -	Theſe two Inſects are found plentifully at the edge of Ponds upon the Inula - - - , (- - - Elecampane) their Larvæ reſemble thoſe of the green Tortoiſe-Beetle. - - - - - - - -
Elles rongent les feuilles de l'aunée. J'en ai nourri pluſieurs, qui m'ont toujours donné des caſſides vertes panachées, ce qui m'á fait ſoupçonner que les rouges & les vertes ne différoient que par l' âge. - - -	They feed on the leaves of the Elecampane. I have fed ſeveral with it, which have always afforded me green, ſpotted, Tortoiſe-Beetles which led me to ſuſpect that the red and the green differed only from age, - -
Pour m'en aſſurer encore, j'ai nourri des caſſides de couleur verte. Le vert de leurs étuis a pris peu à peu une teinte d'abord jaune, puis de plus en plus rouge; ce quî prouve que la différence de couleur ne vient que de l' âge plus ou moins avancé.	To convince myſelf further of this, I fed ſome of the green ones. The green part of their Wing-Sheaths aſſumed by ſlow degrees a Tint, which was at firſt yellow, but afterwards became redder and redder; which proves that the difference of color only ariſes from the difference of age.

v. Geoffr. Tom. I. p. 314. 315.

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‡ Victus & larvæ & imaginis e foliis plantarum in primis Carduorum.	The food both of Larva and Imago is derived from the leaves of Plants, eſpecially Thiſtles.

v. Fabr. Gen. Inſ. 30. 26.

|| CASSIDA.	TORTOISE-BEETLE.
1. *viridis*.	1. green.
2. *maculata* - - - - - - - -	2. ſpotted - - - - - - - - -
Forte praecedentis mera varietas.	perhaps a mere variety of the preceding one.

v. Fabr. Spec. Inſ. TOM. I. 107. 108.

No. VII. v. Tab. II. Fig. 4.

CONOPS.

* VESICULARIS? C. *Antennis* clavatis, *Vertice* veſicato, veſpiformis:

Abdomine incurvo, poſtice fuſco;

Alis ſæpe incumbentibus.

Antennæ nigræ; *Thorax* niger, maculis tribus luteis; quarum duæ ad Scapulas unâ ſcutellari triangulatim diſpoſititæ ſunt. Punctum luteum inter baſin Alarum & Halteres, Halteres etiam lutei. Abdominis pars ſuperior antice nigro luteoque alternatim variavit; pars poſtica fuſca. Pedes quaſi bidigitati.

Veſica capitis diaphana, poſitione mutata verſicolor; antice ſpectata fuſca, poſtice ob colorem faciei perlucentem luteſcens.

CONOPS.

BLADDER-HEAD. C. Waſp-like with clavated *Antennæ*, and a bladder-like excreſcence on the *Head:*

Abdomen incurved, fuſcous towards the *Tail*;

Wings frequently incumbent.

The Antennæ black, Thorax ſpotted with yellow, one ſpot at each Shoulder, one in the place of Eſcutcheon, placed as it were triangularwiſe with the other two. A ſmall yellow ſpot ou each ſide, between the baſe of the Wings and the Halteres; which latter were alſo yellow. Abdomen at the upper part towards the Thorax alternately black and yellow; towards the Tail incurved and fuſcous, with a bronze-like appearance. Legs and Feet variegated; latter appearing as if divided into two Toes. Greater part of ſpace above, between the Eyes, like a bubble or bladder.

I SUSPECT that vegetable as well as animal juices, contribute to the nouriſhment not only of this Species, but alſo of the generality of dipterous Inſects; eſpecially perhaps of ſuch as have their Mouths provided with both Sucker and Proboſcis;

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* INSECTA DIPTERA.

257. CONOPS. *Os* Roſtro porrecto, geniculato.

veſicularis 4. C. antennis clavatis mucronatis ſubferrugineis ſubconnexis, occipite veſiculari, abdomine glanco-flaveſcente.

DIPTEROUS INSECTS.

257. CONOPS. Mouth furniſhed with an extended jointed Beak.

bladdered. C. Antennæ clavated, pointed, ſubferrugineous, ſub-connected; Occiput bladdered, Abdomen glaucous-yellowiſh.

v. Lin. Syſt. Nat. Inſ. 1004, 1005.

§ Habitat minus frequens apud nos.

It is not very frequently found with us.

v. Lin. Faun. ſuec. 1903.

Proboſcis ; both which Inſtruments Fabricius † has aſcribed to the Conops *veſicularis*.

The general habit of the Inſect ſtrikingly reſembled that of a Waſp : when the Wings were incumbent, which was a common though not a conſtant poſition, it was of courſe difficult to aſcertain their number or to diſcern the *Halteres*, which ſpoke it *dipterous*.

The bubble or bladder on the Head, which has been conſidered as diſtinguiſhing the Species, it perhaps only a ſexual Character ; I obſerved of mine, that the bladder being tranſparent, it was liable to aſſume different tints according as it was viewed ; for if it was viewed in front it appeared fuſcous ; if from behind, yellowiſh ; which I have ſuppoſed owing to the yellow color of the face ſeen through it.

It is I think pretty evident, that the Title *veſicularis* has been aſſigned on account of this bladder ; yet in the deſcription of the *veſicularis* in the fabrician Syſtem, reference is given to Geoff. Inſ. 2. 472. 13. and in that of the *macrocephala* both in this Syſtem, and in the linnæan, to 471. 12, of the ſame Author, who has inclined to conſider theſe two as Varieties of each other, ‡ but in neither of

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† INSECTORUM Claſſis VIII. ANTLIATA.	INSECTS Claſs VIII.
Os hauſtello : vagina inarticulata.	*Mouth furniſhed with a Sucker : with a jointleſs Sheath.*
177. CONOPS. *Os* hauſtello abſque proboſcide.	177. CONOPS. *Mouth* furniſhed with a Sucker and Proboſcis.
Proboſcis porrecta, ultra baſin geniculata.	*Proboſcis* extended, jointed beyond the baſe.
Hauſtellum vagina univalvi abbreviata ſetaque unica.	*Sucker* with a ſhort univalve Sheath, and a ſingle briſtle.
Antennæ clava acuminata.	*Antennæ* with a pointed *club*.
veſicularis. 1. C. nigricans, occipite veſiculari, abdomine flaveſcente, baſi nigro.	bladdered. C. Blackiſh, with a bladdered occiput ; Abdomen yellowiſh, with a black baſe.
Habitat in Europae nemoribus.	Inhabits Groves in Europe.
Puncta duo antica thoracis ſcutellumque ferruginea.	Two anterior thoracic dots and Eſcutcheon ferrugineous.

v. Fabr. Syſt. Entom. p. 746, 796. &c.

‡ SECTIO QUINTA. *Claſſis Inſectorum.* INSECTA DIPTERA. ASILUS.	SECTION V. *of the Claſs of Inſects.* DIPTEROUS INSECTS ASILUS.
Antennæ ſetaceo-conicæ quadripartitæ.	*Antennæ ſetaceous-conical quadripartite.*
Os roſtro ſubulato acuto.	*Mouth furniſhed with an awl-ſhaped Beak.*
Ocelli tres.	*Stemmata three.*
13. ASILUS *antennis capite longioribus clavatis acuminatis, nigro rufoque varius, glaber, ſegmentis abdominalibus omnibus margine flavis, alis fuſcis margine albo.* - - - - - - - - - - - - - - - - On trouve cet inſecte avec le précédent, dont il pourroit bien n'être qu'une variété.	ASILUS *variegated with black and rufous, ſmooth ; all the abdominal Segments yellow at the margin ; Wings fuſcous edged with white ; Antennæ clavated, pointed, longer than the Head.* - - - - - - - - - - - - - This Inſect is found with the preceding, of which it may perhaps be only a Variety.

v. Geoff. Tom. II. p. 449. 465. 472, 473.

of his deſcriptions, has particularized the bladder on the Head. In No. 12, he (Geoffroy) has given a reference to Reaum. inſ. tom. 4, tab. 33. f. 12. 13; and Linnæus in the deſcription of the *macrocephala* has referred to the ſame figures: From the reſemblance that the 12 fig. bears to my Species; the ſtrong manner in which Reaumur has noticed the ſimilitude to a Waſp;[||] the ſuſpicions hinted by Geoffroy, and the want of perſpicuity in his deſcriptions, and in thoſe of other Authors herein mentioned, collectively conſidered; it appears to me probable, that the *macrocephala* and the *veſicularis* are, as before hinted, one and the ſame Species: Future Obſervations may perhaps prove this connection, not only in theſe, but likewiſe in divers others, which are at preſent conſidered as Varieties, or even as diſtinct Species.

I wiſh further to obſerve that the deſcription of the Conops *flavipes* in the Fauna ſueccica [§§] in ſeveral reſpects very nearly accords with mine herein. Is it likely that the bladder on the Head may be only occaſionally inflated? or, is this remarkable Character common to more than one Species of Conops?

I caught mine in the Month of Auguſt 1783; it ſettled on a Flower; It was a pretty Inſect: I do not recollect to have ever caught a ſecond.

[||] Il y a une Mouche - - - qui reſſemble ſi fort à une petite Guêpe, que je ne lai jamais priſe avec les doigts, qu'avec les précautions avec leſquelles on, prend une Mouche armée d'un aiguillon, & je ne me ſuis aſſuré qu'elle en étoit depourvue, qu'apres avoir reconnu qu'elle n'avoit que deux ailes.

There is a Fly - - - which is ſo very like a ſmall Waſp, that I never took it up in my Fingers, without uſing the ſame precaution, as in taking up a Fly with a Sting; nor was I ever convinced that it had none, till I perceived that it had only two Wings.

——v. Reaum. T. 4, part. 2d. p. 254.——

[§§] *Caput* & *Antennæ* nigra. *Thorax* ater puncto flavo utrinque ante & pone alas. *Scutellum* puncto flavo. *Halteres* ferruginei. *Abdomen* clavatum, nigrum, poſtice caneſcens: - - -

Head and Antennæ black. Thorax dark with a yellow dot on each ſide before and behind the Wings: Eſcutchen marked with a yellow dot. Poiſers ferruginous. Abdomen clavated, black, grayiſh behind.

No. VIII. v. Tab. II. Fig. 5.

CICADA.	FROG-HOPPER.
[*] CORNUTA.	HORNED.

THOUGH I believe this Inſect to be pretty common, yet it is ſo ſingular as in my opinion, to deſerve particular notice; having been already deſcribed and figured by various Authors, leſs need here be ſaid about it; and I ſuppoſe it was owing to what others had done before, that my Notes are ſo remarkably

[*] INSECTA HEMIPTERA. | HEMIPTEROUS INSECTS.

223. CICADA. | 223. FROG

deficient in its deſcription. It may however be proper to remark that Linnæus has erred in ſuppoſing that this Species does not leap, § and in having conſequently in the Syſtema Naturæ, ſeparated it from the leaping tribe, which is inconſiſtent with the teſtimony of Scopoli ‡ and Geoffroy ||, and contrary to my own experience. I further obſerved a curious circumſtance in mine; which pitching on it's Head, and expanding it's Wings, ſpun itſelf round like a Top. It was procured from a Hedge about May 1781.

223. CICADA. *Roſtrum* inflexum.	223. FROG-HOPPER. *Beak* inflexed.
Antennæ ſetaceæ.	*Antennæ* ſetaceous.
Alæ IV. membranaceæ, deflexæ.	*Wings* 4, membranous, deflexed.
Pedes (pleriſque) ſaltatorii.	*Legs* (in moſt) formed for leaping.
** CRUCIATÆ *Thorace utrinque cornuto.*	** Thorax horned on each ſide.
cornuta. 6. C. thorace bicorni poſtice ſubulato longitudine abdominis, alis nudis.	horned. F-H. Thorax bicornute, awl-ſhaped behind; length of the Abdomen; Wings naked.
Habitat in Carduis Salicibus.	*Inhabits* Thiſtles, and Willows.

v. Lin. Syſt. Nat. Inſ. 704. 705.

§ CICADA *cornuta* - - - - - - - - - - Non ſalit.	horned FROG-HOPPER - - - - - - - - - - does not leap.

v. Lin. Faun. ſuec. No. 879.

† INSECTORUM VII. RYNGOTA.	INSECTS Claſs VII.
Os roſtro : vagina articulata.	Mouth furniſhed with a Beak : with a jointed Sheath.
* * * * *	* * * * *
151. MEMBRACIS. *Os* roſtro inflexo.	*Mouth* furniſhed with an inflexed Beak.
Labium corneum, elongatum, apice membranaceum, ſubulatum.	*Lip* horny, lengthened, membranous at the tip, awl-ſhaped.
Antennæ ſubulatae, fronti inſertae.	*Antennæ* awl-ſhaped, fixed to the forehead.
cornuta. 8.	*horned* 8.

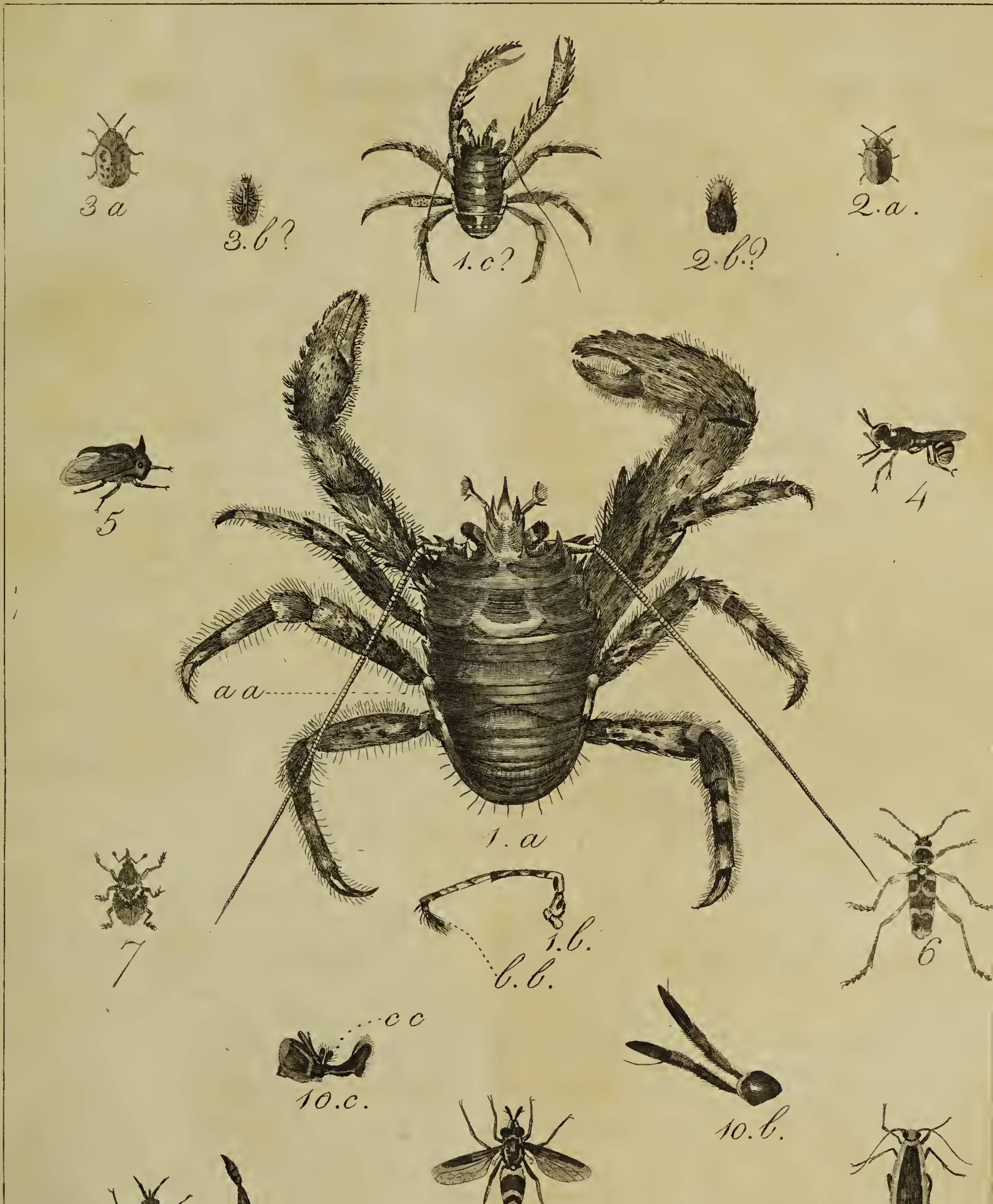
v. Fabr. Syſt. Entom. 673, 675, 676, &c.

‡ ORDO II. PROBOSCIDEA.	ORDER II.
HEMIPTERA. *Linn. Syſt. Nat.*	HEMIPTEROUS *of Lin. Syſt. Nat.*
OS TERMINATUM PROBOSCIDE; SUB PECTORE INFLEXA. ALÆ SUPERIORES SEMICORIACEÆ, CORIACEÆ TOTÆ; MEMBRANACEÆ; NULLÆ.	Mouth terminated with a Proboſcis, inflexed under the Breaſt. Upper Wings ſemicoriaceous, wholly coriaceous, membranous, or none.
(***) *Elytris membranaceis.*	(***) *Upper Wings membranous.*
340. CICADA *Cornuta*	340. *horned* FROG-HOPPER.
- - - Pedes ſaltatorii.	- - - Legs formed for leaping.

v. Scop. Entom. carn. 340. &c.

|| SECTIO SECUNDA *Claſſis Inſectorum.* INSECTA HEMIPTERA. CICADA.	SECTION II. *of the Claſs of Inſects.* HEMIPTEROUS INSECTS. FROG-HOPPER.
Articuli tarſorum tres.	*Feet of three joints.*
Antennæ capite breviores.	*Antennæ ſhorter than the Head.*
Ocelli duo.	*Stemmata two.*
Roſtrum inflexum.	*Beak inflexed.*
Alæ quatuor, inferiores cruciatæ.	*Wings four, under Wings croſſed.*
18. CICADA *thorace acute bicorni, pone producto.*	FROG-HOPPER. with the Thorax acutely bicornute, produced behind.
On trouve cet inſecte dans les bois, arrêté ſur les hautes tiges de fougere, de *cirſium* & *d'aſclepias.* Il ſaute très-bien, & il n'eſt pas aiſé de le prendre.	This Inſect is found in the Woods, on the high Stalks of Fern, of *Cirſium* (or *ſoft Thiſtle,*) and *Aſclepias:* It leaps very well, and it is not eaſy to catch it.

v. Geoff. Tom. I. p. 410. 412. 423.



MM del:

P. Mazell Sculp